

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 November 2001 (01.11.2001)

PCT

(10) International Publication Number
WO 01/82187 A1

(51) International Patent Classification⁷: **G06F 17/60**

(21) International Application Number: PCT/US01/12990

(22) International Filing Date: 19 April 2001 (19.04.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/553,940 21 April 2000 (21.04.2000) US

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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,
MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL,
TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

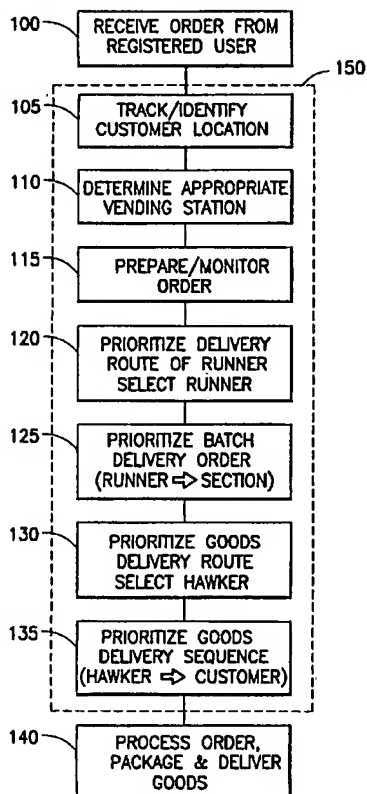
(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CI,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR EFFICIENTLY ORDERING AND DELIVERING GOODS TO CUSTOMERS



(57) Abstract: A system and method allows efficient ordering of food or products within a venue (100) by determining the availability of the items, or the earliest time the order is available for pickup, and selecting a vendor based on the availability. The system and method optimize the service by determining the location of the customer (105) and determining the vendor best able to fulfill the order based upon when the order can be prepared and the proximity of the vendor to the customer.

WO 01/82187 A1



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**SYSTEM AND METHOD FOR EFFICIENTLY ORDERING
AND DELIVERING GOODS TO CUSTOMERS**

RELATED APPLICATIONS

This application claims priority under 35 U.S.C. §
5 119(e) from U.S. Provisional Application No. 60/130,386
of Thorne, et al. filed April 21, 1999 which is herein
incorporated by reference in its entirety.

FIELD OF THE INVENTION

The present invention relates generally to a
10 system and method for efficiently ordering and vending
items to customers at a venue. In particular, the
present system and method allows a customer to place an
order for one or more items from a location within or
without the venue, and have the ordered items optimally
15 prepared and readied for pickup or delivery. The
ordered items may then be delivered to the customer in
an expedient and efficient manner. The goods may be
ordered in real time when they are desired to be
processed and delivered, or at an earlier point in time
20 for subsequent delivery.

BACKGROUND OF THE INVENTION

In venues throughout the world, patrons attend
events. While at those events, they often desire food,
beverages or other goods that are typically sold at
25 concession stands or other vending stations.

To obtain desired goods, the patron needs to
travel from his seat in the venue to the vending
station. Upon arrival at the vending station, the
patron usually must wait on a substantial line to place
30 his or her order, and then await preparation of the

order. Subsequently, ladened with the order, the patron usually travels back to his or her seat in the venue.

Some venues have mobile vendors that travel
5 throughout the venue selling various items. Often it is inconvenient to await the arrival of such a mobile vendor, and the selection is limited to what the mobile vendor is carrying. In addition, the mobile vendor's stock is likely to be somewhat old, for example, hot
10 foods can be cold and ice cream can be melted. Where the mobile vendor carries apparatus to maintain the freshness of the food, such as an ice-box, the mobile vendor can then carry that much less inventory, making the process expensive and inefficient.

15 More recently, certain venues have begun offering "waitperson" service their VIP sections, which permit the patron to remain in the seat while his or her order is taken. Often the waitperson is provided a wireless device that transmits the order back to the VIP section
20 kitchen, and a runner delivers the order to the seat. Seiko and Micros manufacture wireless for the stadium waitperson. The present devices are generally the size of a videocassette and three times as heavy. At extra cost, they provide credit card swipe attachments and
25 receipt printers. These systems use wireless intranets or wireless mini cells, but can serve only a limited number of patrons.

ChoiceSeat, Inc. offers the installation of wire-
line "smart seats", whereby touch screens are attached
30 to every seat for instant replay, and a variety of interactive services, including goods ordering and

delivery. In addition to catering to VIP sections like Seiko and Micros, the wire-line systems can services a larger number of venue patrons. The wire-line systems are expensive to buy, install, insure, and maintain, and thus, cost prohibitive for large scale distribution throughout a venue.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a system and method for readying an order of one or more items for pickup. The instant system and method comprises the steps of: receiving a customer order for at least one item; determining the availability of the order at a plurality of vending stations; selecting the vending station to prepare the order based on the availability of the order; notifying the vending station to prepare the order; and preparing the order.

It is a further object of the present invention to provide a system and method for readying one or more items from an order for pickup. The instant system and method comprises the steps of: receiving a customer order for at least one item; determining the availability of the item at a plurality of vending stations; selecting one of the vending stations for preparation based upon availability of the item; notifying the vending station to prepare the item; and preparing the item.

It is yet a further object of the present invention to provide a system and method of fulfilling an order to a customer. The instant system and method comprises the steps of readying an order for pickup;

determining the availability of the items in the order, the delivery availability of the order, or a combination of the order availability and delivery availability of the order, at a plurality of vending stations; and selecting a vending station based upon the order availability, delivery availability, or a combination of the order availability and delivery availability.

It is yet a further object of the present invention to provide a system and method of fulfilling an order of one or more items to a customer in a venue. The instant system and method comprises the steps of: receiving an order for the delivery to a specified location within a venue; determining the availability of each item at a plurality of vending stations; selecting a vending station for vending each item upon the availability of the item, the delivery availability of the item, or a combination of the item and delivery availability of the item; vending each item at the selected vending station selected for that item; and delivering each vended item to the specified location.

A still further object of the present invention is to provide a system and method for delivering an order for one or more items to a customer. The instant system and method comprises the steps of: receiving an order for the delivery of one or more items to a specified location within a venue; preparing the ordered items at a vending station; vending each ordered item at the vending station; selecting delivery personnel to deliver the ordered items based upon

availability of the delivery personnel; and delivering the ordered items to the specified location.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a flow chart diagram illustrating an optimization sequence for processing and delivering a customer order according to one embodiment of the present invention.

FIGURE 2 is a flow chart illustrating the general operation of the venue ordering and delivering system according to one embodiment of the present invention.

FIGURE 3 is a flow chart illustrating the sequence of operation for the order processing, packaging and delivery optimization routine according to one embodiment of the present invention.

FIGURE 4 is a flow diagram illustrating three modes of operation for engaging the inventive system.

FIGURE 5 shows an illustrative block diagram detailing the order and delivery system according to one embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

To explain the system and method for efficiently ordering and delivering goods according to the present invention (hereinafter "inventive system" or "system"), a discussion regarding the typical operational components of the system follows.

A vending station, as used herein refers to a location, typically within a venue, where items are stocked, prepared and/or sold. A vending station may include a preparation area and/or inventory area for vending items, such as food, merchandise and souvenirs. Once prepared, customer orders are packaged and readied

for delivery in the vending station. The term vending station may also encompass an area where food, merchandise and/or souvenirs can be sold to walk-up customers.

5 There are several different manpower categories, classified by position and job description, to facilitate delivering ordered items to customers. These positions include Regular Runners and Relief Runners (hereinafter Runners), Hawkers, Food Preparers,
10 Packers and Sequencers. It is important to note that although these positions are described individually, there job responsibilities can be mixed, shared and altered as particular scenarios dictate. The description of these manpower categories is thus
15 provided for the purpose of illustration. A person skilled in the art can appreciate the inherent flexibility in assigning various tasks to these positions.

 Hawkers are primarily responsible for serving
20 customers in a particular section of the venue. In one embodiment of the invention, Hawkers will use a wireless communication device, such as a two-way pager, to receive instructions regarding the delivery of ordered items. In addition, the communication device
25 will allow the Hawker to communicate with the system and confirm delivery of the items. Hawkers will typically not leave their designated sections. However, the system is capable of monitoring and forecasting customer demand and may temporarily
30 reassign Hawkers to assist bordering venue sections on an as-needed basis. In one embodiment of the

invention, system reassignment of Hawkers is performed through the wireless communication device.

Runners are categorized into at least two subcategories - Regular Runners and Relief Runners.

5 Runners are designated to a given vending station and batch deliver ordered items from the vending station to a designated location for a particular seating section, or, in some instances, directly to a seat location within the venue. The system prioritizes the Runner's
10 delivery route using various parameters discussed in detail below.

When order demand is high in a particular seating section, Relief Runners can be deployed to assist Regular Runners in batch delivery of ordered items.
15 Relief Runners are dispatched from a manpower pool comprised of skilled personnel that can be directed to assist management as needed, including preparation and delivery of ordered items. (As used herein, the term including means, including, without limitation, unless
20 otherwise specified.) Accordingly, personnel from the manpower pool may serve a variety of purposes, including: providing emergency breaks to all employees, for example due to accidents, sickness, etc., and delivery assistance in emergency situations.
25 Relief Runners may also be redeployed as Regular Runners from sections of low order frequency to sections of high order frequency.

Food Preparers are typically placed in the vending station and prepare ordered food items for customers.
30 Generally, customer orders can be forwarded to a Food Preparer from the system and displayed on a display

device, such as a computer monitor within the vending station preparation area. The Food Preparer then prepares the customer's food on an as needed basis. Aside from its ordinary and customary meaning, as used
5 herein, the term "prepare", when referring to a food item, means in essence to change the state, form, temperature or packaging of an item or group of items, from the time they are received at the venue until the time they are served. Such changes may include, for
10 example, dispensing a drink from, for example, a container or dispensing machine, cooking an item, warmin an item, cooling an item, popping popcorn, warming and/or bagging peanuts, making a sandwich, etc. The system may also anticipate customer food orders
15 based on several factors, including: venue; vending station location within the venue; type of event; time of event; historical food order levels; and present activity; and notify the Food Preparers accordingly.

Once the order is prepared, Packers place the
20 ordered items in containers, such as bags or cartons. The order may be combined with other items ordered by the same customer and packaged for delivery by placing some form of identification, for example, in the form of an order ticket or receipt, on the package. Food
25 Preparers or Sequencers may also serve as Packers.

After the customer order is individually packaged, a Sequencer may prepare the order for delivery by packing batch delivery containers for the Runners. The Runners may deliver the batch delivery containers
30 to the Hawkers who break down the orders for delivery to the customers. The Sequencer may pack the Runner's

batch delivery container according to sequence directions provided by the inventive system. This method provides for sequential delivery of the ordered items based on factors such as order size, order time,
5 and location of the delivery within the seat section. The Sequencer may also manually pack the batch delivery containers.

With reference now to the drawings, Figure 1 illustrates an optimization sequence for processing and
10 delivering a customer order utilizing the present inventive system. A customer engages the system and places an order. System engagement and customer interaction may be achieved by several means, including cell phones, touch tone phones, smart phones with
15 internet access, various personal computer systems, including pocket PC's and palmtop devices, venue supplied terminals, personal data assistants (PDA's), pagers and similar wireless data communication devices. See Figure 4 for a detailed description of customer
20 notification and system access through these devices.

As shown in step 100, the system receives an order from a registered customer. The customer location, i.e. seating location within the venue, is then tracked in step 105. Customer location tracking can be
25 performed by various methods, including: customer data entry, for example where the customer inputs his location, i.e. seating section, row, and seat number; by input device self identification; by a global positioning system device (GPS); or a by caller
30 identification system.

Once the customer location is resolved, the system determines the appropriate vending station to efficiently process the customer order as shown in step 110. The system selects a vending station that can
5 ready an order for pickup by Runners or customers according to a variety of criteria, such as, when the order can be prepared and the proximity of the vending station to the customer. Since orders can be placed for a variety of goods and for as few as a single item,
10 to "ready" an order could be as simple as only requiring placing a single item on a tray. More commonly, however, more than one item would be readied, and each may require some form of preparation or cooking, such as, for example, preparing a hot dog on a
15 roll, or pouring a beverage into a cup and covering the cup. Readyng an order includes assembling all of the items, and may also include assembly of the items together with incidental goods, such as straws, napkins or condiments. When readied, and order can be picked
20 up at a vending station by a customer or by a Runner; generally orders are picked up at a window or counter of the vending station.

The selection of a vending station to ready the customer's order for pickup requires a determination of
25 availability. Availability, as that term is used herein, refers not to whether an item or order is on-hand at a vending station, but to the estimated time the item or order can be ready for pickup at a particular vending station.

30 The selection of a vending station may also take into account: the length of the route between the

customer and the vending station; the customer's location within the venue; the vending station's location within the venue; the number and location of Runners and Hawkers, and their present assignments; the
5 activity within that and other nearby or remote sections; the sequence of deliveries or pickups currently scheduled; the size of the order; the time of the order, the estimated availability; overload conditions presented by earlier orders; cost; and any
10 variance due to external factors, such as, for example, a dropped tray, a kitchen problem or a crowd problem leading to a blocked aisle in the venue.

In a preferred embodiment, the criteria are considered to select a vending station based upon the
15 earliest time the order can be delivered to a customer. In another embodiment, the vending station is selected based on earliest time the order can be ready for pickup. In still another embodiment, vending stations may be selected based upon the earliest time one or
20 more items of the order can be ready for pickup or can be delivered to a customer. In another embodiment, the criteria may be considered to select a vending station based upon cost savings.

Once a vending station is selected to prepare an
25 item or order, the vending station is notified to prepare the item or order as shown in step 115. The system may also monitor the preparation activity, including Packer and Sequencer activity load, as shown in step 115, to estimate a pickup time.

30 The vending station may begin preparing the item or order when it receives notification.

In one embodiment of the invention, the Food Preparers, Packers and Sequencers provide input to the system to monitor their activity. In another embodiment of the invention, the activity time to
5 complete the order preparation, packing and sequencing is based on estimated processing times.

In a preferred embodiment, the selection of a vending station and estimated processing times can be altered on-the-fly, as the actual activities and
10 criteria are monitored and compared to previous estimates.

In addition to selection of the vending station, delivery personnel, (i.e. Runners and Hawkers) must be allocated and scheduled. In a preferred embodiment, as
15 the order nears being ready for pickup a route is selected, delivery personnel are allocated, and the delivery is prioritized.

As shown in step 120, a Runner is selected and the delivery route is prioritized. When performing these
20 selections, the system may analyze numerous factors, including: the size of the order, including its relation to other orders in the venue and the vending station; the time of the order; the availability of the order; the location of the customer for delivery; the
25 activity of the Runners; and the status of pending orders, including overload conditions present.

Once a Runner and the runner delivery route have been selected, the system prioritizes the batch delivery order for the Runner's batch delivery
30 container as shown in step 125. The Sequencer uses this information to pack the Runners batch delivery

container. The system considers several factors when prioritizing the batch delivery order sequence, including, the size of the order, including, its relation to other orders being delivered to the
5 Runner's section; the time of the order; the availability of the order; and the location of the customer receiving the order.

Similar to the method for selecting a Runner and runner delivery route, the system selects a Hawker and
10 prioritizes the Hawker's item delivery route in step 130. When making these selections, the system may analyze factors, including: the size of the order and its relation to other orders in the Hawker's section; the time of the order; the availability of the order;
15 the location of the customer for delivery; the activity of the Hawkers in other designated areas; and the status of other pending orders, including overload conditions.

Once a Hawker and the item delivery route have
20 been selected, the system prioritizes the item delivery sequence for the ordered items to the customers as shown in step 135. When making these determinations, the system analyzes the size of the order, both in terms of its own size and in relation to other orders
25 being delivered to the selected Hawker; the time of the order; the location of the customer receiving the order within the Hawker's assigned section; and the proximity of other Hawkers in relation to the customer.

The selection of the resources and the estimate of
30 time required for an available order to be delivered to a customer is referred to herein as delivery

availability. In a preferred embodiment, the selection of resources and the estimate of time required for delivery to a customer can be altered on-the-fly as the actual activities and criteria are monitored and
5 compared to previous estimates.

Finally, as depicted in step 140, the order can be processed and packaged by the Sequencer, and delivered by the Runner and Hawker to the customer.

Step 150, (the aggregation of steps 105 through
10 steps 135) thus illustrates the determination of availability of an order, the preparation of an order, and the determination of delivery availability for an order. Accordingly, step 150 shows the optimization sequence for scheduling the processing and delivery of
15 an order utilizing the present inventive system.

A system and method illustrating the general operation of the venue ordering and delivering system according one embodiment of the present invention is shown in Figure 2. A customer wishing to place an
20 order must first access the inventive system as shown in step 200. The customer can then place an order as shown in step 205. See Figure 4 for a detailed description of various methods used by customers to access the system and place orders.

25 Once the customer places the order, a determination is made in step 210 with regard to whether the customer previously registered with the system. In one embodiment of the invention, the customer could have previously registered with the
30 system by placing a prior order. In another embodiment of the invention, the customer could have accessed the

system at some point prior to placing the order and registered as a future user. If it is determined in step 210 that the customer is not registered, customer registration is commenced in step 215. In one embodiment of the invention, information gathered during the customer registration process may include the customer name, phone number, password or personal identification number (PIN), billing information and seat location within the venue.

10 Once the registration information is received, the system verifies the customer billing information in step 220. In one embodiment of the invention, the system obtains the customer's credit or debit card authorization electronically. During this process, a determination is made in step 225 as to whether the system has received authorization to charge the customer's account. If authorization is denied, the customer is provided with a method to contact a customer service agent for the system for assistance as shown in step 230. In one embodiment of the invention, the customer is provided with a telephone number, which may be toll free, to contact the system customer service agent. The customer's use of the system is then terminated. All orders for the customer, if previously placed and delivered, are consolidated and detailed on one bill as shown in step 250. The customer's smart phone/blue tooth, credit or debit card payment is then completed, and authorization to institute additional charges to the customer's account are removed. A receipt is then transmitted to the customer. In one embodiment of the invention, the

customer is electronically mailed (e-mailed) a copy of the transaction receipt. In another embodiment of the invention, the customer is mailed a copy of the receipt.

5 If account authorization is granted to charge the customer's account in step 225, the customer's billing record maintained in conjunction with the inventive system is updated in step 235 to reflect the charges for the order placed in step 205. The order is then
10 processed as previously shown in steps 150 and 140.

 Once the customer's order is processed, packaged and delivered, a determination is made in step 240 with regard to the status of the event being attended by the customer. If the event has not terminated, the order
15 process continues in step 245 and the customer is provided with additional opportunities to place an order. If the venue event has terminated, all orders for the customer are consolidated and charged to the customer's authorized credit or debit account as
20 previously shown in step 250.

 The sequence of operation for the order processing, packaging and delivery optimization routine according to one embodiment of the present invention is shown in Figure 3. Although this embodiment depicts
25 the processing of a single order for the purpose of clarity, the system is designed to scale well beyond that shown.

 As previously described in Figure 2, a customer places an order and proceeds through the registration
30 process. This process is simplified as step 300 in Figure 3. Once the system receives an order and

applies the efficiency optimization sequence depicted as aggregation step 150 in Figure 1, the ordered item is prepared for delivery.

It is a goal of the inventive system to apply a
5 Just-In-Time (JIT) delivery process. Accordingly, in step 305 the system determines whether the ordered items will be ready for pickup and delivery to the customer by the assigned Runner. The JIT process contemplates staggered delivery of ordered items to the
10 customer as well as consolidated order delivery. Staggered delivery may take place, for example if items in the customer's order become available at different times.

If the query in step 305 results in a negative
15 response, the JIT order processing system may queue the customer's order to achieve the most efficient delivery sequence. This operation is depicted in step 310. If the query results in an affirmative response, as shown in step 315, a Packer is send a notification to package
20 the ordered and prepared items, and a Runner is sent a notification to return to the vending station to initiate the delivery process. The Packer and Runner are requested to acknowledge receipt of the notification. In one embodiment of the invention,
25 notification of the Packer and Runner are effected through a two-way paging system.

Once the Runner and Packer are notified of the prepared order, the system updates the order status in the venue database 330 as shown in step 320.

30 The Runner receives the notification to pickup the ordered items in step 335. In one embodiment of the

invention, the notification includes an order identification number and a delivery location. Similarly, the Packer receives the notification to package the ordered item in step 340 and commences
5 packaging of the order. In one embodiment of the invention, the Packers pack the ordered items in a container suitable for delivery by the Runner. In another embodiment of the invention, the Packer packs multiple order containers for a plurality of customers
10 on a bulk delivery device, such as a delivery cart or rack system, for delivery to a designated location. In step 345, the Runner picks-up the packaged items for eventual delivery to the customer.

A determination is made in step 350 as to whether
15 the Runner completed the pick-up of the ordered items. Resolution of this query may be based on the packed order being available for the Runner to deliver, or the Runner's availability to pick-up and deliver the order. If the response to this query is in the negative, i.e.
20 the order was not successfully retrieved by the Runner, the Runner transmits an "unavailable" acknowledgment to the system in step 355. The system will then update the venue database 330 accordingly to reflect this non-event as depicted in step 360, and reassign another
25 Runner at the appropriate point in time. Conversely, if the response to the query in step 350 is in the affirmative, i.e. the Runner successfully retrieves the order for delivery, the Runner transmits an "available" acknowledgment to the system in step 365.

30 Once retrieved, the Runner delivers the order to the appropriate location as shown in step 370. In one

embodiment of the invention, the Runner delivers the order to a designated batch location for further delivery by Hawkers to the customers. In another embodiment of the invention, the Runner delivers the order directly to the customer. Accordingly, the JIT process contemplates Runners and/or Hawkers separately delivering ordered items to customers that were part of the same original customer order, but staggered for efficiency.

10 It is then determined in step 375 whether the Runner successfully delivered the order. This may include a determination of order status with regard to the actual physical delivery of the order, as well as the accuracy of the delivered order. If the Runner does not successfully deliver the order, the Runner transmits a drop-off acknowledgment step 380 indicating the order was not delivered, or the packed order was in error. In one embodiment of the invention, the notification to the system is by way of a wireless communication device.

20 Once the acknowledgment is received, the system makes the necessary changes to the venue database 330 to reflect this change in status, including modification of the customer's billing records in step 360. If the Runner successfully delivers the goods, the Runner transmits an appropriate acknowledgment in step 385.

30 There are several modes of operation that can be used to engage the inventive system and place an order for delivery. In one mode of operation, the customer initiates engagement of the system to place an order.

In another mode of operation, engagement of the system is the result of both customer and system initiation of the inventive system. In still a further mode of operation, the system initiates the ordering process by electronically contacting known customers and notifying them of the availability of the system.

The three modes of operation for engaging the inventive system are shown in Figure 4. The inventive system contemplates engagement by any of the described modes, and any one or combination of the illustrated modes of operations may be available at any given time.

Turning now to Figure 4, for customer initiated engagement, the customer contacts the system to place an order. In one embodiment of the invention the customer engages the system by telephonic means, such as for example by cell phone or touch-tone phone as shown in step 400. The system utilizes the telephone caller identification function (caller ID) or mobile telephone registration information to direct the customer to the appropriate voice response unit (VRU) "phone tree" for the appropriate venue as shown in step 405. The customer then places an order for delivery as shown in step 470.

The system may also use the caller identification information in conjunction with prior registration information to automatically determine the customer's billing information and order delivery location.

In another embodiment for customer initiated engagement of the system shown in step 410, the customer contacts the system through a wired computer network, utilizes a browser or similar program capable

of viewing webpages, and opens a website associated with the inventive system. In this embodiment, the customer interface used to access the wired computer network may be, for example, the customer's home
5 computer, a remote wired computer with Internet access, or a computer placed within the venue to channel customer orders. Once the system-associated website is accessed, the customer connects to the system network in step 460, and places an order as shown in step 470.

10 In a second mode of operation, access to the inventive system is achieved by a combination of system and customer initiated operations. This mode of operation requires a customer to use a wireless device capable of wireless website access. Various devices
15 capable of supporting this mode of operation include: smart cell phones with Internet access; Personal Data Assistants (PDA's) or palmtop computers capable of wireless Internet access; or two-way paging devices. Once the customer activates the wireless device,
20 location based information received through the wireless service registration process automatically brings the customer to the system associated website as shown in step 415. The customer then initiates the browser program on the wireless device in step 420 and
25 connects to the system network in step 460. The customer then places an order as illustrated in step 470. As previously discussed, the location based information received during the wireless registration process may be used in conjunction with prior
30 registration information to automatically determine the

customer's billing information and order delivery location.

In a third mode of operation, access to the system is initiated by system operation. In this mode of operation, the customer must be in possession of a PDA device or digital telephone capable of receiving a wireless broadcast messages, or an SMS capable phone or similar paging device capable of receiving a page. In one embodiment of this mode of operation as shown in step 425, the system transmits a wireless broadcast in the venue microcell indicating the availability of the system for placing orders. In another embodiment of this mode of operation, the system transmits a general page to all known customers in the microcell or serving sector of the venue as shown in step 430. In either embodiment, the customer with the wireless device receives the page or broadcast message indicating the availability of the system for use as shown in step 435.

A determination is then made in step 440 with regard to the capacity of the customer's device to support 2-way communication. If the answer to this query is in the negative, the customer is provided a number to call the system network and place a customer initiated order as described in step 400. If it is determined in step 440 that the customer's device does support 2-way communication, it must further be determined whether automatic redirect of the customer's wireless device to the system's webpage is possible.

If it is determined in step 445 that automatic redirect of the customer's wireless device is possible,

the wireless web browser is automatically redirected to the system's webpage in step 455 and the customer is connected to the system network in 460. The customer may then place an order as shown in step 470.

5 Conversely, if it is not possible to redirect the customer's wireless device in step 445, the customer must manually enter the system's wireless Internet address in step 450. This enables the customer to connect to the system network in step 460 and place an
10 order as shown in step 470.

 An illustrative block diagram detailing the order and delivery system 500 according to one embodiment of the present invention is shown in Figure 5. Figure 5 also shows the data storage system 520 and user device
15 525.

 The data storage system 520 is comprised of several different databases. Information stored in each of the several different databases may be contained in one single data storage system, or may be contained in
20 a plurality of independent data storage systems virtually linked together. Examples of databases contained in data storage system 520 include: a customer billing database to store customer information, including credit/debit card information,
25 e-mail address, and location or seat assignment within the venue; a vendor billing database to store all vendor information for the venue and concessionaire; a venue, map/optimization database to store seat/section numbers, maps for appropriate delivery personnel
30 routes, and delivery personnel communication device information; and an order database to store all actual

orders, assigned delivery personnel, pick-up and drop-off confirmations, delivery shortages, etc. The data storage system 520 can be any database server software, such as ORACLE, SQL Server, etc., running on a server
5 computer.

The order and delivery system 500 has a multi-tier architecture to handle requests from customers comprising the presentation service unit 505, the application service unit 510 and the data service unit
10 515.

The presentation service unit 505 is adapted to connect to the user device 525. In a preferred embodiment, the presentation service unit 505 creates displays for the user device 525 in HTML or HDML, and
15 uses HTTP or WML to send and receive data over the Internet.

In one embodiment of the invention, the user device 525 is an input/output device, preferably an HTML, HDML, or WML based Internet browser, and the
20 connection between the presentation service unit 505 and the user device 525 is preferably the Internet (not shown). In such an embodiment, the customer can access the order and delivery system 500 through the presentation service unit 505 from the customer's own
25 wired personal computer, from a demo kiosk at the venue outfitted with a computer system, or from the user's own palmtop computer or similar wireless device capable of wireless Internet access.

In another embodiment of the invention the user
30 device 525 is a Wireless Application Protocol (WAP) interface and the connection between the presentation

service unit 505 and the user interface 525 is a wireless network. In such an embodiment, the user may access the presentation service unit 505 of the ordering and delivery system 500 by cell phone, PDA, 2-way pager, or similar wireless data device.

In still a further embodiment of the invention, a VRU interface and the connection between the presentation service unit 505 and the user device 525 is a wired network capable of allowing the customer to interface with the presentation service unit 525. In such an embodiment, the user may access the order and delivery system 500 through the presentation service unit 505 using an ordinary telephone network and a touch-tone telephone.

The order and delivery system 500 also contains the application service unit 510. The application service unit 510 is a transactional server operatively connected to the presentation service unit 505. The application service unit 510 implements the logical operations of the order and delivery system 500. Since multiple architectures and platforms are contemplated by the present invention, the application server requirements are open. However, for scalability and portability, the following interfaces are desired: HTTP Java Servlet; HDML Java Servlet; VRU Interface; and a Java Servlet for billing interfaces. Examples of logical operations include, registering users, interfacing with credit/debit card companies and verifying users, accepting customers orders, verifying inventory, accepting payment and updating billing

records, and performing optimization calculations related to order processing and delivery.

The application service unit 510 is also connected to a data service unit 515, which is also part of the
5 order and delivery system 500. The data service unit 515 provides a connectivity layer between the application service unit 510 and the data storage system 520.

While the foregoing describes and illustrates the
10 preferred embodiment of the present invention and suggests certain modifications thereto, those of ordinary skill in the art will recognize that still further changes and modifications may be made therein without departing from the spirit and scope of the
15 invention. Accordingly, the above description should be construed as illustrative and not in a limiting sense, the scope of the invention being defined by the following claims.

CLAIMS

WHAT IS CLAIMED IS:

1. A method of readying an order for pickup, the order being for at least one item, one or more of the at least one item requiring preparation prior to pickup, the method comprising the steps of:

- 5 receiving a customer order for at least one item;
 determining availability of the order at a plurality of vending stations;
 selecting the vending station based on availability of the order;
10 notifying the vending station to prepare the order; and
 preparing the order.

2. A method of readying an order for pickup, the order being for at least one item, one or more of the at least one item requiring preparation prior to pickup, the method comprising the steps of:

- 5 receiving a customer order for at least one item;
 for each of the one or more items requiring preparation, the method further comprising the steps of:
 determining the availability of the item at a
10 plurality of vending stations;
 selecting one of the vending stations for preparation based upon availability of the item;
 notifying the vending station to prepare the item; and

15 preparing the item, thereby readying the item
for pickup.

3. A method of vending an order to a customer, the
order being for at least one item, one or more of the
at least one item requiring preparation prior to
pickup, the method comprising the steps of:

5 readying an order for pickup by the method claimed
in claim 1;

 determining an estimated time the order will be
ready for pickup;

 determining the location where the order will be
10 ready for pickup;

 notifying the customer of the estimated time and
location where the order will be ready for pickup;

 vending the order to the customer at the location
notified.

4. The method of claim 3 wherein the customer is
charged for the order at the time the order is vended
to the customer.

5. The method of claim 3 further comprising the steps
of:

 monitoring the status of the order during
preparation; and

5 notifying the customer of any change in the
estimated time and location for pickup.

6. The method of claim 3 wherein:

 the order includes an indication of the customer's
location, and

the step of selecting the vending station is
5 further based upon the route between the customer's
location and each of the plurality of vending stations.

7. A method of fulfilling an order to a customer, the
order being for at least one item, the method
comprising the steps of:

receiving an order for the delivery of one or more
5 items to a customer at a specified location within a
venue;

determining the availability of each item at a
plurality of vending stations;

selecting a vending station for vending each item
10 based upon the availability of the item at that vending
station;

notifying each selected vending station to prepare
each item for which the vending station was selected;

preparing the at least one item;

15 vending each item at the vending station selected
for that item;

delivering each vended item to the customer at the
specified location.

8. The method of claim 7 further comprising the step
of:

determining a delivery route from each of the
plurality of vending stations to the specified
5 location; and

wherein the step of selecting a vending station is
further based upon the route between the specified
location and each of the plurality of vending stations.

9. A method of fulfilling an order to a customer, the order being for at least one item, the method comprising the steps of:

receiving an order for delivery of one or more
5 items to a customer at a specified location within a venue;

determining the delivery availability of each item from each of a plurality of vending stations to the specified location;

10 selecting a vending station for vending each item based upon the delivery availability of the item at that vending station;

notifying each selected vending station to prepare each item for which the vending station was selected;

15 preparing the at least one item;
vending each item at the selected vending station for that item;

delivering each vended item to the specified location.

10. The method of claim 9 further comprising the step of:

determining a delivery route between each of the plurality of vending stations and the specified
5 location; and

wherein the step of selecting a vending station is further based upon the route between each of the plurality of vending stations and the specified location.

11. A method of fulfilling an order to a customer, the order being for at least one item, the method comprising the steps of:

receiving an order for the delivery of one or more
5 items to a customer at a specified location within a venue;

determining the availability of each item at a plurality of vending stations;

determining the delivery availability of each item
10 at a plurality of vending stations based upon the availability of each such item at the plurality of vending stations;

selecting a vending station for vending each item based upon the delivery availability of the item at
15 that vending station;

notifying each selected vending station to prepare each item for which the vending station was selected;

preparing the at least one item;

vending each item at the selected vending station
20 for that item;

delivering each vended item to the specified location.

12. The method of claim 11 further comprising the step of:

determining a delivery route from each of the plurality of vending stations to the specified
5 location; and

wherein the step of selecting a vending station is further based upon the route between each of the

plurality of vending stations and the specified location.

13. A method of fulfilling an order to a customer, the order being for at least one item, the method comprising the steps of:

receiving an order for the delivery of at least
5 one item to a customer at a specified location within a venue;

determining availability of the order at a plurality of vending stations;

determining delivery availability of the order at
10 a plurality of vending stations based upon the determined availability of the order; and

selecting the vending station based on delivery availability of the order.

14. A method of fulfilling an order to a customer, the order being for at least one item, the method comprising the steps of:

receiving an order for the delivery of one or more
5 items to a customer at a specified location within a venue;

preparing the at least one ordered item at a vending station;

vending each ordered item at the vending station;

10 selecting a first delivery person to deliver the at least one ordered item from the vending station to a designated location proximal to the specified location; and

selecting a second delivery person to deliver the
15 at least one ordered item from the designated location
to the specified location.

delivering the at least one ordered item to the
specified location via the first and the second
delivery persons.

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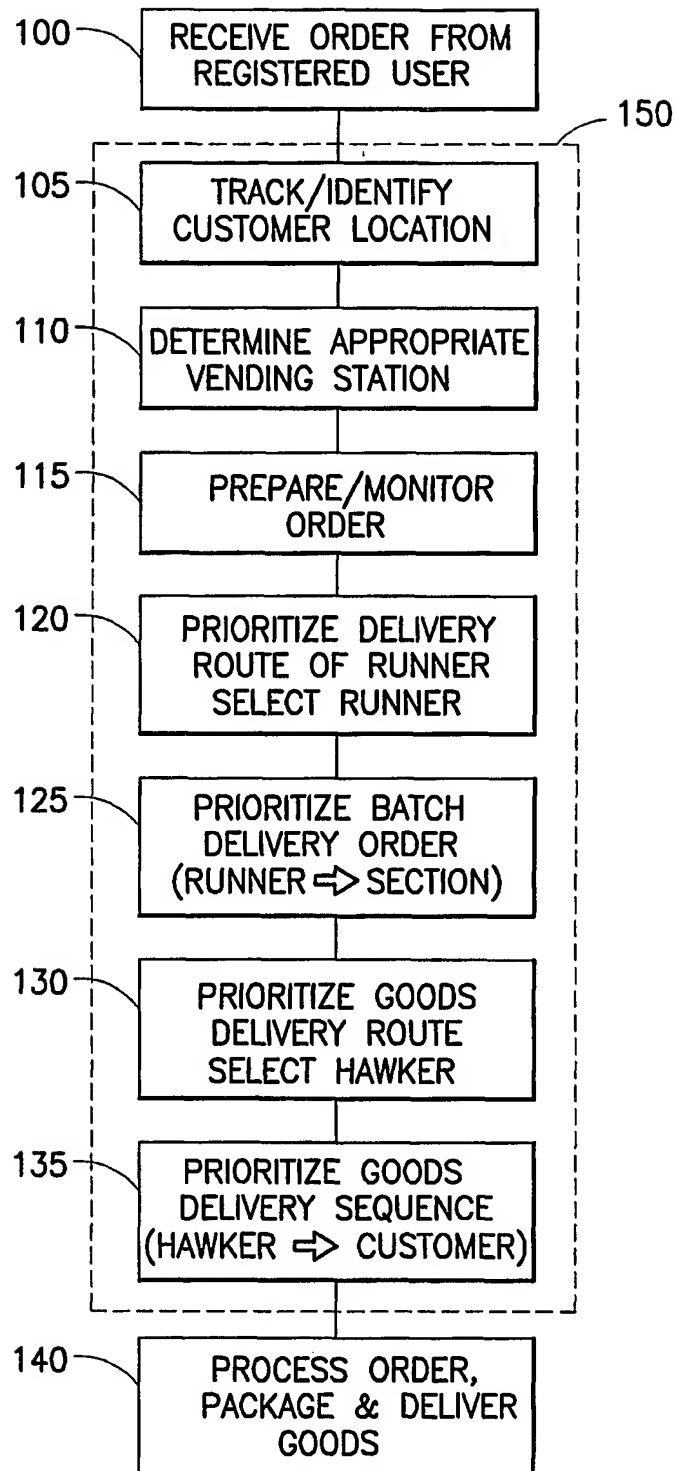


FIG. 1

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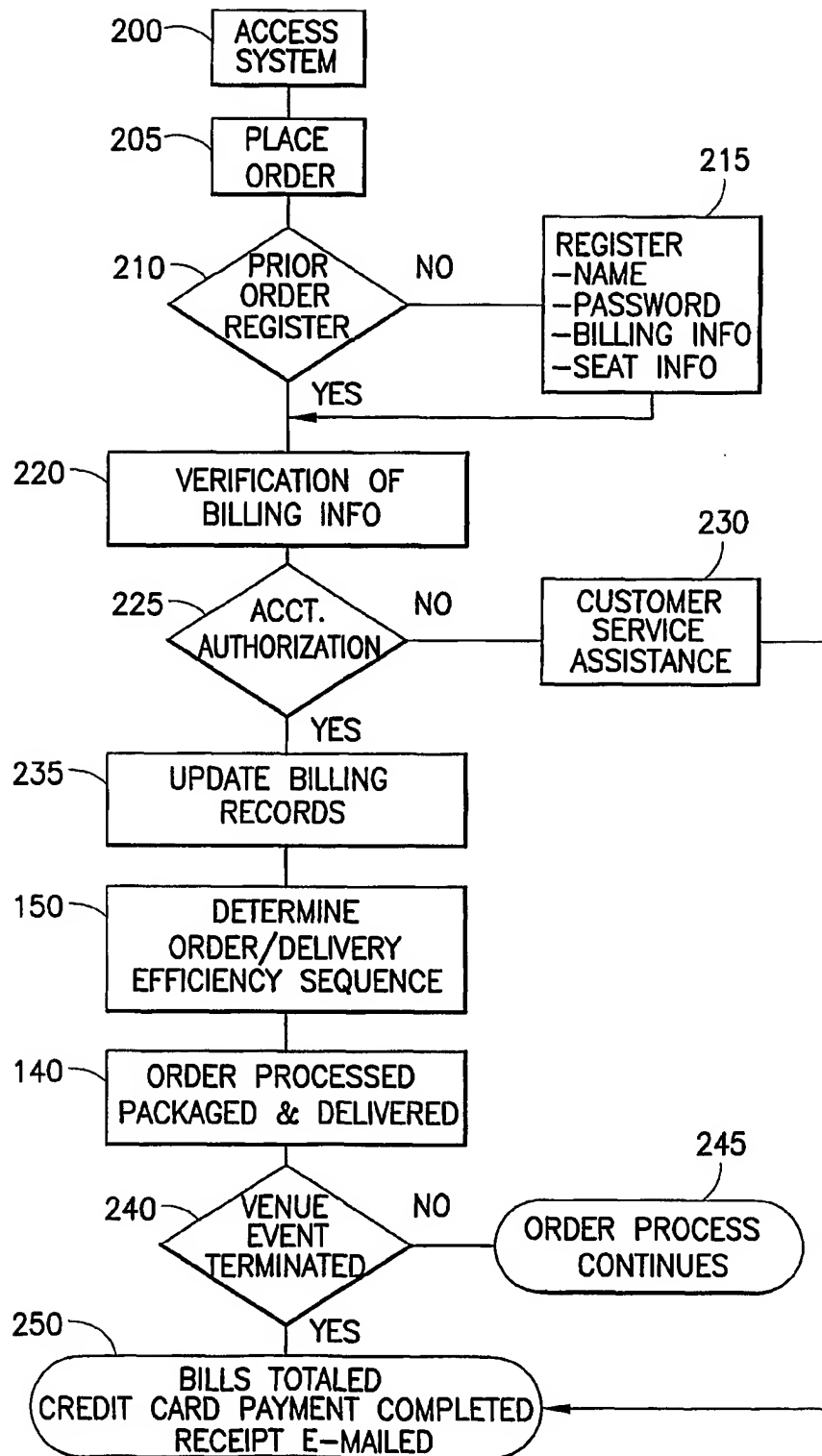
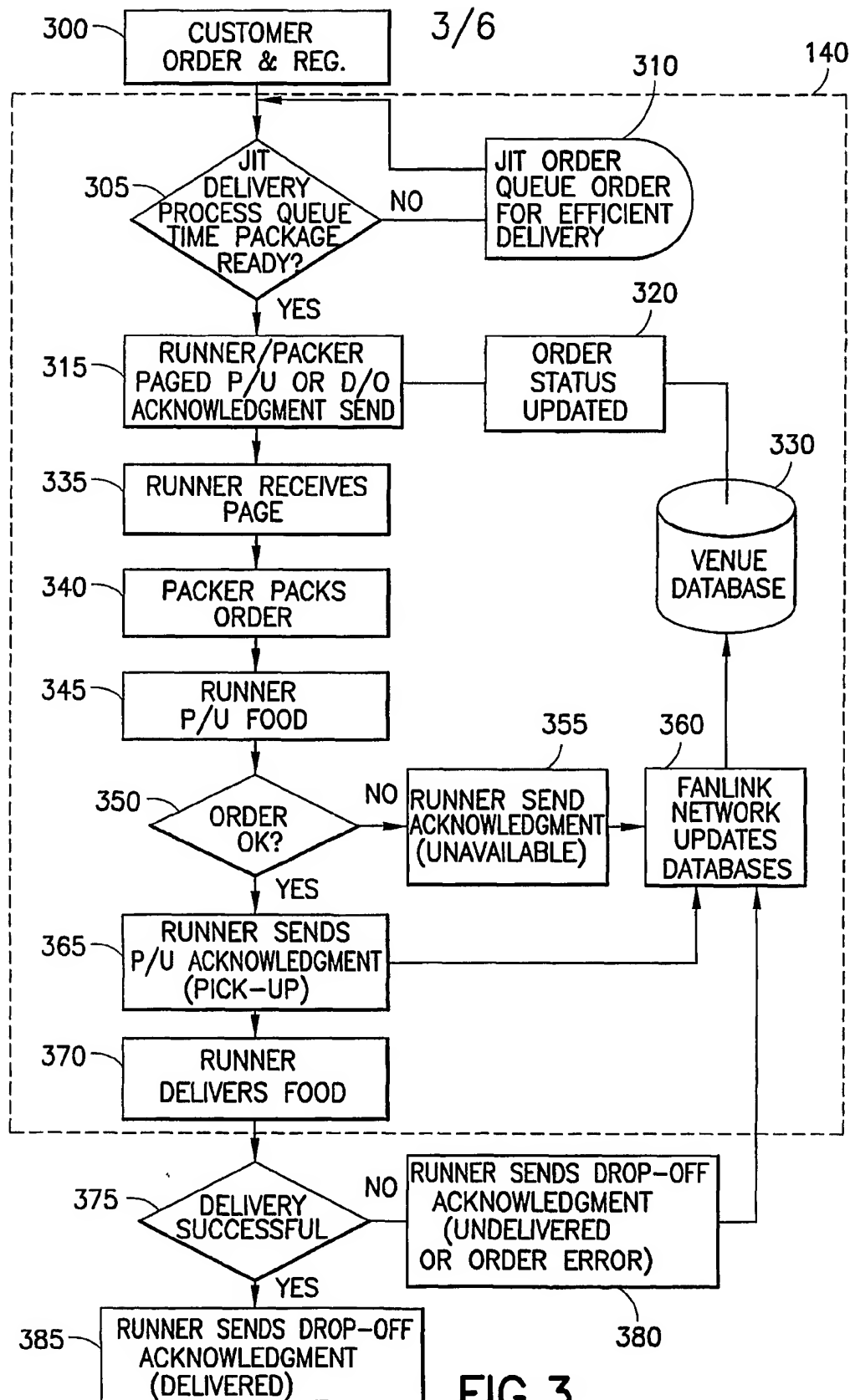


FIG.2



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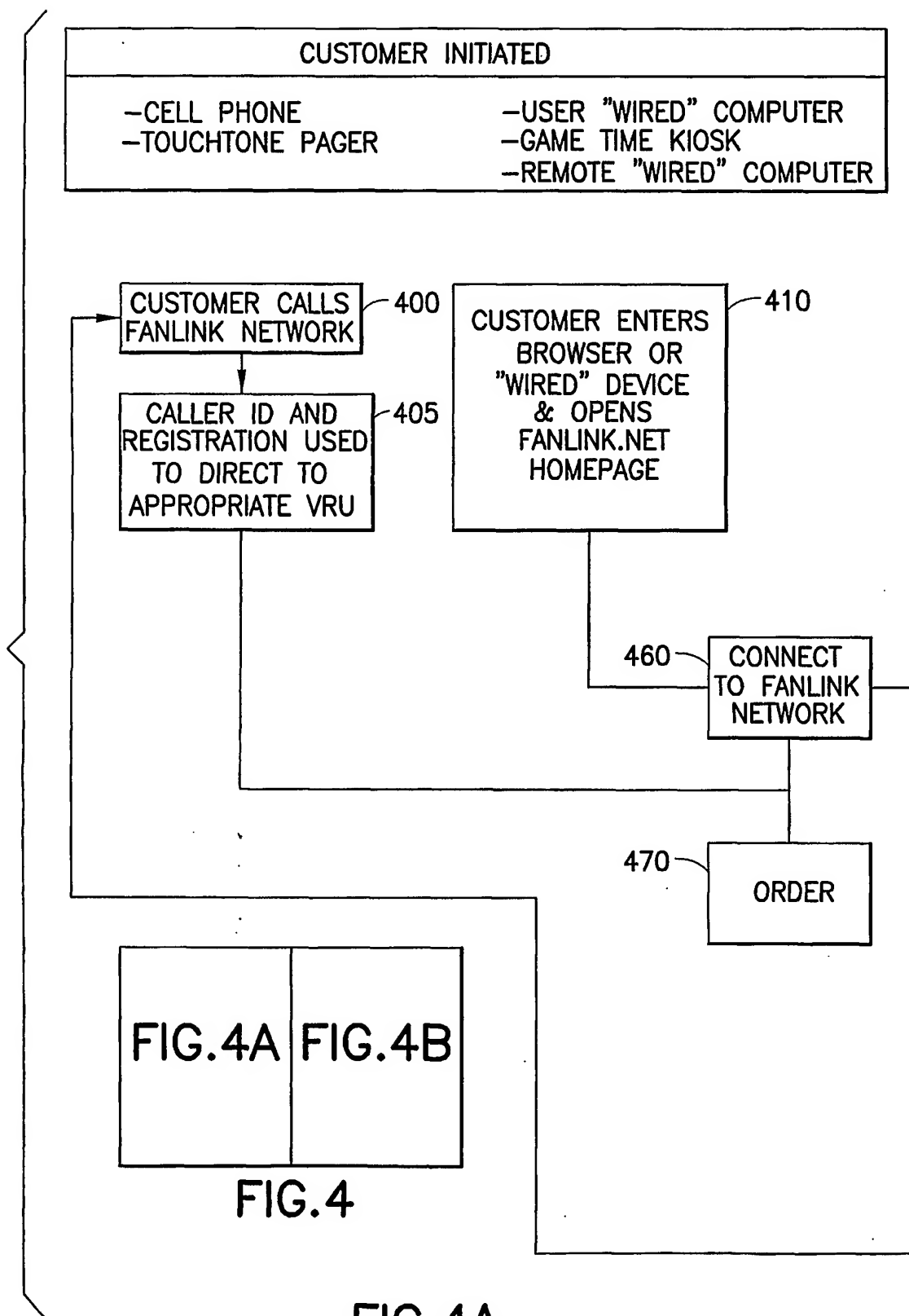


FIG. 4

FIG. 4A

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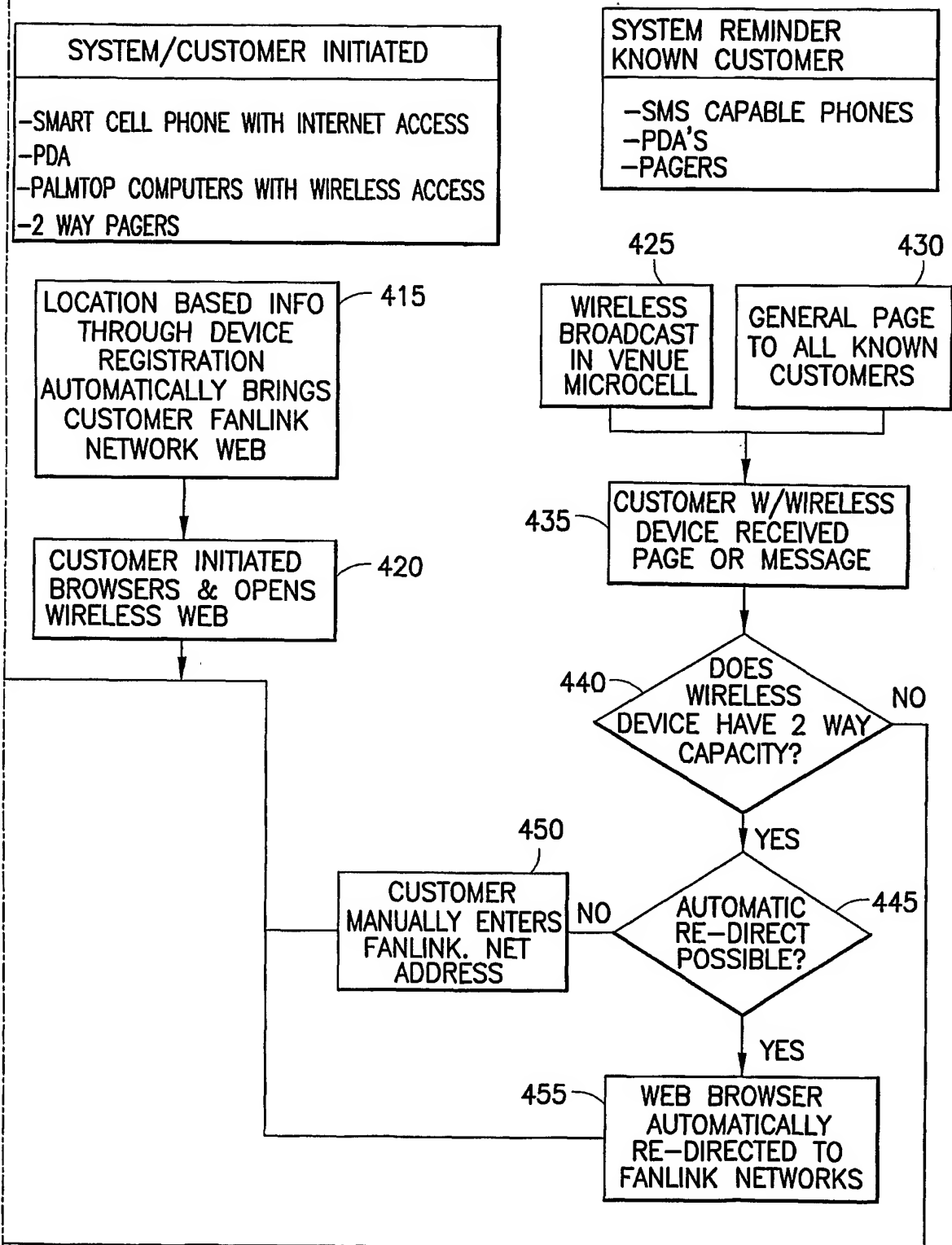


FIG.4B

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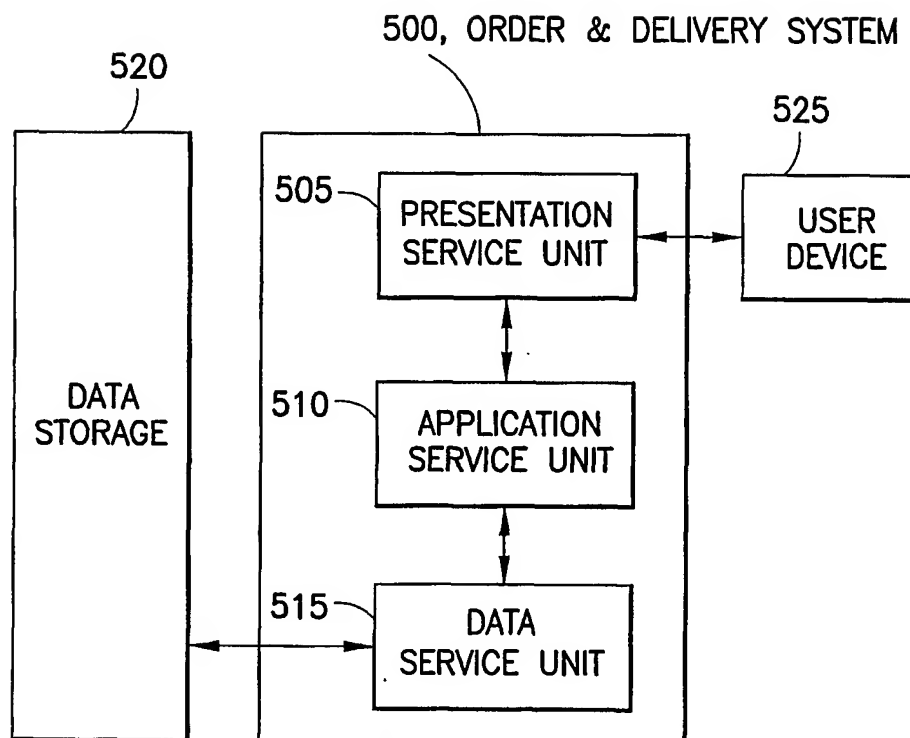


FIG.5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/12990

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G06F 17/60

US CL :705/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

STN search terms: order, earliest pickup, location, proximity

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,797,818 A (COTTER) 10 January 1989, col. 2, lines 10-30, col. 5, lines 5-15, summary	1-14
X	US 5,852,809 A (ABEL et al.) 22 December 1998, summary, col. 8, line 35 - col. 9, line 30, col. 10, lines 10-35, col. 11, lines 5-35	1,2
A	US 5,128,862 A (MUELLER) 07 July 1992, abstract, col. 4, lines 10-15, col. 5, lines 10-15	1-14
A,P	US 6,208,976 B1 (KINEBUCHI et al.) 27 March 2001, abstract, col. 4, lines 10-35, col. 19, lines 20-30	1-14

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

23 AUGUST 2001

Date of mailing of the international search report

19 SEP 2001

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/12990

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,959,686 A (SPALLONE et al) 25 September 1990, abstract, col. 2, lines 40-50	1,3